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ACUTE NORMOVOLEMIC HEMODILUTION DECREASES BLOOD PRODUCT USE AND POSTOPERATIVE MORTALITY AND MORBIDITY FOLLOWING CARDIAC SURGERY

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Background: Acute Normovolemic Hemodilution (ANH) is an established technique with suggested efficacy in reducing transfusion requirements following cardiac surgery. The degree which ANH minimizes blood product usage and whether this impacts clinical outcomes remains controversial. Our purpose was to examine differences in blood product usage and morbidity and mortality related to ANH in cardiac surgical patients.

Methods: All non-isolated CABG patients since 2008(n=1,319) at a single center were studied. Data including blood product use, post-operative morbidity and mortality were retrieved from our local STS database. ANH was performed using standard autologous blood collection bags and stored at room temperature. Total volume collected was based on predicted on-pump hematocrit. Multivariate analyses were conducted to evaluate the role of ANH on risk for blood product use after controlling for multiple confounding variables including, age, gender, preoperative hematocrit, and elective status.

Results: The ANH group had fewer comorbidities compared to the no ANH group. The ANH group received significantly fewer units of blood products (PRBC's, FFP, Cryo and Platelets) than the no ANH group ($p < 0.001$). After adjusting for clinical covariates, ANH was associated with reduced risk for intraoperative blood product use (OR=0.41, $p<0.001$), including RBC (OR=0.32, $p<0.001$) and FFP use (OR=0.49, $p<0.001$), Intraoperative RBC & FFP transfusion were independently associated with greater risk for prolonged ventilation ($p<0.001$ & $p=0.003$) and operative mortality ($p=0.005$ & $p=0.04$).

Conclusions: ANH patients received fewer intraoperative blood products regardless of the type of surgery. Furthermore, this decreased blood product exposure manifested decreased ventilator time and post-operative mortality. ANH should be considered as a valuable adjunct to current blood conservation techniques to minimize blood product exposure, reduce complication risk, and improve outcomes.